Entergy

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10 CFR 50.73

GNRO-2019/00029

August 22, 2019

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Supplemental Licensee Event Report 2019-001-01, Automatic Reactor Shutdown Due To Activation Of Generator Lockout
Grand Gulf Nuclear Station, Unit 1
NRC Docket No. 50-416
Renewed Facility Operating License No. NPF-29

Dear Sir or Madam:

Attached is Licensee Event Report 2019-001-01, Automatic Reactor Shutdown Due To Activation Of Generator Lockout. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) for an event or condition that resulted in an automatic actuation of the reactor protection system, as specified by 10 CFR 50.73(a)(2)(iv)(B).

This letter contains no new commitments. If you have any questions or require additional information, please contact Jim Shaw at 601-437-2103.

Sincerely,

E. A. Larson

Eric A. Larson
EAL/ram

Attachment: Licensee Event Report 2019-001-01

(See Next Page)

cc: NRC Region IV - Regional Administrator
NRC Senior Resident Inspector, Grand Gulf Nuclear Station
NRR Project Manager

Attachment
Licensee Event Report 2019-001-01

NRC FORM 366 (04-2018) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Grand Gulf Nuclear Station, Unit 1	05000416	1 OF 3

4. Title

Automatic Reactor Shutdown Due To Activation of Generator Lockout

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
									N/A	05000N/A
02	23	2019	2019	- 001	- 01	8	22	2019	Facility Name	Docket Number
									N/A	05000N/A

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Jim Shaw, Manager Regulatory Assurance	(601) 437-2103

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No		N/A	N/A	N/a

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On Saturday, February 23, 2019, Grand Gulf Nuclear Station (GGNS) experienced an unplanned, automatic reactor shutdown without complications. This shutdown was initiated by the Reactor Protection System (RPS), as a result of a main generator lockout when the Generator Protective Relays responded to a negative phase sequence condition. All systems responded as designed. The negative phase sequence protection scheme set-point was changed (reduced from 9 percent to 5 percent) during the 2018 refueling outage, as part of the new main generator protective relay modification. The new set-point was exceeded resulting in the main generator trip. The direct cause of the trip was the negative phase sequence protection scheme 5 percent set-point for the Generator Protective Relays was exceeded. The cause has been determined to be the failure to ensure systematic and rigorous control of the configuration change process. Corrective actions include returning the negative phase sequence relay set-point back to 9 percent and establishing an audible alarm to alert the control room staff of any of the Generator Protective Relays approaching a protective scheme set-point. Planned actions include the development and implementation of improved standards for overseeing and controlling engineering rigor during the design change process.

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A) for the actuation of the reactor protection system, as specified by 10 CFR 50.73(a)(2)(iv)(B).

There were no consequences to the general safety of the public, nuclear safety, industrial safety and radiological safety for this event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000-416	2019	- 001	- 01

NARRATIVE

Plant Conditions:
Grand Gulf Nuclear Station (GGNS) Unit 1 was operating at approximately 100 percent power in MODE 1. There were no structures, systems, or components that were inoperable that contributed to the event.

Description:

On February 23, 2019, at 1458 hours, the GGNS experienced an automatic reactor shutdown. This shutdown was initiated by the Reactor Protection System (RPS) [JC]. The initiating event was a main generator lockout due to actuation of the Generator Protective Relays responding to a negative phase sequence condition. All systems responded as designed.

An investigation by GGNS personnel identified that the negative phase sequence protection scheme set-point was changed (reduced from 9 percent to 5 percent) during the in 2018 refueling outage, as part of the new Main Generator Protective Relay modification. The four new Main Generator Protective Relays are digital relays that assimilate inputs and actuate in a one-out-of-two-taken-twice logic to initiate a protective generator trip. These four digital relays contain all the generator protection schemes as inputs and actuation of the relays initiates a generator trip.

Further, it was identified that the generator phase imbalance during normal operating condition can approach and on occasion exceed the new 5 percent relay set-point. During the February 23, 2019 event, the new lower set-point for the negative phase sequence protection scheme was exceeded, resulting in the Generator Protective Relays actuating and main generator trip.

Reportability:
This event was reported under 10 CFR 50.72(b)(2)(iv)(B) as an event resulting in an actuation of the reactor protection system. Further this event was reported under 10 CFR 50.72(b)(3)(iv)(A) as required by 10 CFR 50.72(b)(3)(iv)(B).

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A) for the actuation of the reactor protection system, as specified by 10 CFR 50.73(a)(2)(iv)(B).

Direct Cause:
The direct cause of the trip was the negative phase sequence protection scheme 5 percent set-point for the Generator Protective Relays was exceeded.

Cause:
The Root Cause of the event was Engineering Leadership failed to ensure that the appropriate standards and expectations for adherence to systematic and rigorous configuration change processes were met.

Corrective Actions:
Implemented:
The negative phase sequence relay set-point was adjusted back to 9 percent and an audible alarm now alerts the control room staff of any of the protective schemes sensing a condition warranting generator protection.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000-416	2019	- 001	- 01

NARRATIVE

Grand Gulf Design Engineering and key stakeholders reviewed critical components and safety related engineering changes completed during the time period between September 2016 and February 2019 along with pending modifications for extent of cause in the execution of standards.

Planned:
Develop a permanent engineering change to approve negative phase sequence relay set-point was adjusted back to 9 percent.

Develop and implement a workshop to communicate standards for detail quality review for preparation development of an Engineering Change in accordance with EN-DC-115 Attachment 9.19 Standard Design process. Incorporate examples of acceptable products and contrast with examples of poor quality products and incorporate learning activities for quality review of products to demonstrate understanding specifically targeted at Topic note development, Use of Internal OE, Calculation reviews and Owner's acceptance of vendor products in accordance with site procedures.

Develop and implement a standard for performing Engineering Design Review for Engineering changes. Establish in the standard critical attributes for review, requirements for organizational engagement at key milestones, and requirements for risk ranking for prioritization for review of engineering changes.

Develop a detailed quality review checklist with attributes required for preparation of an Engineering Change in accordance with site procedures.

Develop and implement job aids for performing Owner's Acceptance of Vendor products and incorporate into the Engineering Change Process in accordance with site procedures.

Develop a detailed critical attributes list for third party review for engineering changes using criteria for each phase of a modification in accordance with site procedures.

Safety Significance:
The incorrect set-point resulted in an automatic unplanned Reactor SCRAM as a result of Generator Lockout and Turbine Trip signals. All safety systems responded as designed. There were no other actual consequences to safety of the general public, nuclear safety, industrial safety and radiological safety for this event.

The actual consequences were an automatic, unplanned Reactor SCRAM as a result of Generator Lockout and Turbine Trip signals. There were no other actual consequences to safety of the general public, nuclear safety, industrial safety and radiological safety for this event.

There was no challenge to protecting the health and safety of the general public because all Emergency Core Cooling Systems (ECCS) and Engineered Safety Features (ESF) equipment were operable and available prior to the automatic Reactor SCRAM. Operators followed the appropriate off-normal procedures and responded appropriately to the automatic SCRAM.

Previous Similar Events:
Entergy conducted a three year review, as described in NUREG-1022 guidance, and no similar events were revealed.